



STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

0471007
FILE COPY

Water Quality Board
K.C. Shaw, P.E.
Chairman

William R. Williams
Vice Chairman

Robert G. Adams
Nan Bunker

Ray M. Child, C.P.A.

John R. Cushing, Mayor

Dianne R. Nielson, Ph.D.

Ronald C. Sims, Ph.D.

Douglas E. Thompson, Mayor

J. Ann Wechsler

Don A. Ostler, P.E.
Executive Secretary

Michael O. Leavitt
Governor

Dianne R. Nielson, Ph.D.
Executive Director

Don A. Ostler, P.E.
Director

288 North 1460 West
P.O. Box 144870
Salt Lake City, Utah 84114-4870
(801) 538-6146
(801) 538-6016 Fax
(801) 536-4414 T.D.D.
www.deq.state.ut.us Web

February 29, 2000

Mr. Ron Ryan
SF Phosphates Limited Co.
9504 North Hwy. 191
Vernal, UT 84078-7802

Dear Mr. Ryan:

Subject: Final Ground Water Discharge Permit No. UGW470001

Enclosed, please find the final ground water discharge permit and statement of basis for SF Phosphates' tailings impoundment. We received one comment during the public notice period, from the Utah Mining Association, supporting the draft permit.

Please note the effective date of the permit and the compliance schedule items which are tied to that date. Also note the permit's expiration date. If you need a renewal for this permit you must apply for one at least six months before that date.

The legislatively-mandated fee for this permit action is based on 88 hours of staff time, billed at \$60 per hour. Please remit \$5280 to the Division of Water Quality at your earliest convenience.

If you have any questions please contact Mark Novak of this office.

Sincerely,

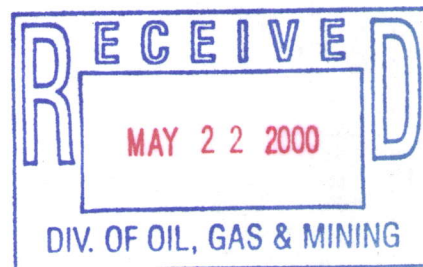
Dennis Frederick, Manager
Ground Water Protection Section

MTN
DF:fb

Enclosures (2)

cc: Uintah Basin Health Dept. (W/encl)
Dan Marble, Dam Safety, DNR (W/encl)
Stacy Carroll
JBR Consultants (W/encl)

P:\WQ\PERMITS\WNOVAK\WP\SFPHFTR.LTR.WPD
FILE:SF PHOSPHATES UGW470001



FILE COPY

Permit No. UGW470001

STATE OF UTAH
DIVISION OF WATER QUALITY
UTAH WATER QUALITY BOARD
SALT LAKE CITY, UTAH 84114-4870

MTN
Out

GROUND WATER DISCHARGE PERMIT

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended, the Act,

S.F. PHOSPHATES LIMITED COMPANY
9401 NORTH HIGHWAY 191
VERNAL, UTAH 84078-7802

is granted a ground water discharge permit for the operation of a tailings storage facility in Uintah County, Utah.

The tailings storage facility is located on the following tracts of land (Salt Lake Base and Meridian):

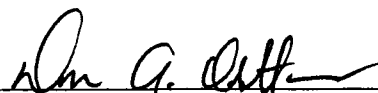
NE 1/4, SW 1/4, SE 1/4, Sec. 36, T. 2 S., R. 21 E.
NW 1/4, NE 1/4, Sec. 1, T. 3 S., R. 21 E.
SE 1/4, SW 1/4, NW 1/4, Sec. 31, T. 2 S., R. 22 E.
NE 1/4, NW 1/4, Sec. 6, T. 3 S., R. 22 E.
SW 1/4, Sec. 32, T. 2 S., R. 22 E.
NW 1/4, Sec. 5, T. 3 S., R. 22 E.

The permit is based on representations made by the permittee and other information contained in the administrative record. It is the responsibility of the permittee to read and understand all provisions of this permit.

The facility shall be constructed and operated in accordance with conditions set forth in the permit and the Utah Ground Water Protection Regulations.

The permit shall become effective on February 28, 2000.

The permit and the authorization to operate shall expire at midnight, February 28, 2005.



Executive Secretary
Utah Water Quality Board

I.	SPECIFIC PERMIT CONDITIONS	1
A.	GROUND WATER CLASSIFICATION	1
B.	BACKGROUND GROUND WATER QUALITY	1
C.	GROUND WATER PROTECTION LEVELS AND SURFACE WATER STANDARDS	3
D.	WASTE CONTAINMENT AND DISCHARGE MINIMIZATION TECHNOLOGY	3
E.	COMPLIANCE MONITORING REQUIREMENTS	4
F.	REPORTING REQUIREMENTS	8
G.	NONCOMPLIANCE STATUS	10
H.	COMPLIANCE SCHEDULE	12
II.	REPORTING REQUIREMENTS	13
A.	REPRESENTATIVE SAMPLING	13
B.	ANALYTICAL PROCEDURES	13
C.	PENALTIES FOR TAMPERING	13
D.	REPORTING OF MONITORING RESULTS	13
E.	COMPLIANCE SCHEDULES	13
F.	ADDITIONAL MONITORING BY THE PERMITTEE	13
G.	RECORDS CONTENTS	14
H.	RETENTION OF RECORDS	14
I.	NOTICE OF NONCOMPLIANCE REPORTING	14
J.	OTHER NONCOMPLIANCE REPORTING	15
K.	INSPECTION AND ENTRY	15
III.	COMPLIANCE RESPONSIBILITIES	16
A.	DUTY TO COMPLY	16
B.	PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS	16
C.	NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE	16
D.	DUTY TO MITIGATE	16
E.	PROPER OPERATION AND MAINTENANCE	16
IV.	GENERAL REQUIREMENTS	17
A.	PLANNED CHANGES	17
B.	ANTICIPATED NONCOMPLIANCE	17
C.	PERMIT ACTIONS	17
D.	DUTY TO REAPPLY	17
E.	DUTY TO PROVIDE INFORMATION	17
F.	OTHER INFORMATION	17
G.	SIGNATORY REQUIREMENTS	17
H.	PENALTIES FOR FALSIFICATION OF REPORTS	18
I.	AVAILABILITY OF REPORTS	19
J.	PROPERTY RIGHTS	19
K.	SEVERABILITY	19
L.	TRANSFERS	19
M.	STATE LAWS	19
N.	REOPENER PROVISIONS	19

I. SPECIFIC PERMIT CONDITIONS

A. GROUND WATER CLASSIFICATION

Based on preliminary data, ground water near the tailings storage facility ranges in quality from Class I to Class III. A final determination of ground water class at each monitor well will be made following accelerated background monitoring required under Part I.E.4(c)(4).

B. BACKGROUND GROUND WATER QUALITY

A preliminary estimation of ground water quality at monitor wells near the tailings storage facility is contained in Tables 1 and 2. A final determination of ground water quality and its variability at these wells will be made following accelerated background monitoring required under Part I.E.4(c)(4).

TABLE 1.

Background ground water quality in upgradient monitor wells.
Preliminary estimate based on available data. Units in mg/l, unless otherwise noted.

	Weber Aquifer WW-D	Moenkopi Fm		Alluvial Aquifer
		GW-2	GW-4	GE-1
TDS	215	4175	4705	1150
Na	2.5	580	402	20
K	0.9	13	13	2.5
Mg	22	128	316	68
Ca	50	460	466	233
Cl	1	36	76	22
4	30	2795	2975	540
Hardness	218	1675	2460	860
Total P	<0.01	0.02	0.02	1.8
U	0.0042	0.0013	0.0012	0.09
Gross Alpha, pCi/l	3.2	8	28	5.4
Gross Beta, pCi/l	2.7	10	25	7

TABLE 2

Background water quality in downgradient monitor wells.
Preliminary estimation based on available data.
Units in mg/l, unless otherwise noted.

	Weber Aquifer	Moenkopi Formation				Alluvial Aquifer			
		CO-2	CO-4	GE-6	CO-6	GE-4	GE-5	GE-2	GE-3
TDS	1100	3135	3855	4240	730	3470	295	2980	3510
Na	13	81	352	771	11	174	3	109	132
K	3.4	22	17	13	2	24	1.6	8	8
Mg	55	164	171	126	53	178	15	194	190
Ca	232	569	492	451	132	550	71	445	572
Cl	6	24	56	88	9	34	1	40	75
SO ₄	640	1935	2480	3015	345	2190	95	1780	2040
Hardness	806	2100	1930	1645	548	2110	238	1910	2210
Total P	<0.01	0.2	0.02	0.9	0.33	0.04	0.58	1.9	0.17
U	0.0037	0.025	0.016	0.06	0.005	0.022	0.004	0.023	0.006
Gross Alpha, pCi/l	1.8	27	23	28	6.3	24	3.4	30	11
Gross Beta, pCi/l	2.8	44	38	18	1.6	26	1.5	18	11

C. GROUND WATER PROTECTION LEVELS AND SURFACE WATER STANDARDS

Insufficient data exists at the time of permit issuance for an accurate determination of background water quality and protection levels which are derived from this data. Protection levels will be established following accelerated background monitoring required under Part I.E.4(c)(4).

Applicable surface water standards in Big Brush Creek must be met at the downstream monitoring point, where Highway 191 crosses the stream.

<u>Parameter</u>	<u>Surface Water Standard</u>
Total Dissolved Solids	1200 mg/l
Gross Alpha	15 pCi/l
Combined Ra-226 and Ra-228	5 pCi/l
Iron	1 mg/l

<u>Surface Water Indicator Parameter</u>	<u>Action Level</u>
Total Phosphorus	0.05 mg/l
Gross Beta	50 pCi/l

Colorado River Basin Salinity Forum

Discharge of salts due to the tailings facility expansion must be kept to the lowest level feasible.

D. WASTE CONTAINMENT AND DISCHARGE MINIMIZATION TECHNOLOGY

1. Authorized Discharge

Only solids and water from the phosphate ore milling operation and domestic wastewater treated to meet secondary standards may be discharged to the tailings impoundment, in addition to stormwater runoff from the area which naturally drains into the impoundment.

2. Waste Containment

The tailings storage facility is located mainly over the outcrop of the Moenkopi Shale, a formation with generally low permeability which contains gypsum and other soluble salts. Wastewater from the ore milling process is of better quality than ground water in the Moenkopi. Because of these characteristics of the subsurface, and because of the size of the impoundment, lining will not be required.

3. Discharge Minimization Technology

There is a potential that the higher hydraulic head caused by water impounded in the tailings storage facility could cause increased leaching of soluble salts from the Moenkopi Shale beneath the impoundment. As a compliance schedule item (Part I.H.4), SF Phosphates shall conduct a study to estimate the rate and pathways of flow and the chemistry of seepage from the tailings storage facility, and its effects on waters of the state, under current and future hydraulic head conditions. Based on this information, the Executive Secretary shall determine whether additional efforts for discharge minimization are necessary.

The tailings dam was built over three stream channels filled with alluvium. The previous owners of the mine site installed slurry cutoff walls in these channels to collect seepage from the tailings impoundment. Studies done by SF Phosphates indicate that at least one of these walls may not be functioning as designed. Based on results of the study of seepage flow required above, SF Phosphates may be required to study the feasibility of minimizing seepage from the tailings dam. If required, this study must address the necessity and feasibility of restoring the cutoff walls to their intended function or upgrading seepage control.

E. COMPLIANCE MONITORING REQUIREMENTS

1. Sampling Quality Assurance Plan

All water quality monitoring to be conducted under this permit shall be conducted in accordance with the general requirements, hereunder, and the specific requirements of the Sampling Quality Assurance Plan to be developed for this permit. The plan must list procedures for taking ground and surface water samples, and analytical methods to be used, with their minimum detection limits. The plan must be submitted within 30 days of the effective date of this permit, and shall become an enforceable appendix to this permit upon approval by the Executive Secretary. Once approved, analytical methods may only be changed with Executive Secretary approval.

2. Compliance Monitoring Wells

The permittee has constructed 16 compliance monitoring wells. Information on these wells is listed in Table 3. These wells shall be used to monitor ground water quality in several aquifers and also the performance of cutoff walls:

Moenkopi ground water: upgradient at GW-2 and GW-4; downgradient at CO-2, CO-4 and GE-6

Alluvial aquifer: upgradient at GE-1; downgradient at CO-6, GE-2, GE-3, GE-4 and GE-5

Weber Aquifer: Upgradient at water supply well WW-D; downgradient at water supply well WW-E

Effectiveness of cutoff walls shall be evaluated by measuring water levels at wells CO-1 through CO-6.

In addition, the permittee shall install two additional wells to monitor ground water quality. One well shall be installed in the Gartra Grit Member downgradient of the tailings dam. This well shall be monitored according to the requirements for downgradient wells listed below in Part I.E.4. Another well shall be installed in the alluvial aquifer at a location which can provide an estimation of the water quality in that aquifer unaffected by discharge from the tailings dam. This well shall be monitored according to the requirements for upgradient wells. All future monitor well construction must conform to the standards contained in the RCRA Technical Enforcement Guidance Document, OSWER 9950.1.

TABLE 3. Monitor Well Information

Hole ID	MINE COORDINATES		Elevation (cap)	Latitude	Longitude	Depth of Screened Interval (ft.)
	Northing	Easting				
GW-1	31,879.349	54,720.862	6112.3	40°35'58"	109°30'20"	125 - 145
GW-2	31,007.211	54,213.025	6129.954	40°35'19.7"	109°30'26.5"	55 - 75
GW-3	31,572.674	52,226.885	6137.568	40°35'56.2"	109°30'52.5"	75 - 95
GW-4	32,732.370	54,628.980	6107.02	40°36'6.8"	109°30'20.5"	55 - 75
CO-1	30,862.160	62,392.470	5731.4	40°35'46.2"	109°28'39.5"	5 - 25
CO-2	30,858.280	62,457.230	5734.89	40°35'46.7"	109°28'38.7"	25 - 45
CO-3	29,838.520	63,067.520	5689.95	40°35'36.3"	109°28'31.2"	5 - 25
CO-4	29,982.360	63,188.690	5687.14	40°35'37.8"	109°28'29.2"	50 - 70
CO-5	32,288.910	61,294.260	5769.98	40°36'1.2"	109°28'53.5"	22 - 42
CO-6	32,338.170	61,688.460	5753.61	40°36'1.3"	109°28'48.5"	22 - 42
GE-1	31,423.209	62,847.918	5693.175	40°35'59.5"	109°28'40.5"	10 - 30
GE-2	32,189.974	62,320.423	5730.515	40°35'52.1"	109°28'33.7"	16.5 - 36.5
GE-3	31,288.982	63,274.046	5685.711	40°35'50.9"	109°28'28.5"	15 - 35
GE-4	30,737.112	63,159.001	5685.406	40°35'45"	109°28'30"	15 - 35
GE-5	30,104.903	63,622.291	5681.808	40°35'39"	109°28'24"	10 - 30
GE-6	29,556.399	62,813.780	5771.613	40°35'34"	109°28'34.5"	112 - 136

3. Protection of Monitoring Well Network

All compliance monitoring wells must be protected from damage or from contamination due to surface spills. They shall be maintained in full operational condition for the life of this permit. Any well that becomes damaged beyond repair or is rendered unusable by any cause shall be replaced by the permittee within 90 days or as directed by the Executive Secretary.

4. Ground Water Monitoring Requirements

- a. Ground Water Level Measurements: Ground water level measurements shall be made quarterly in each monitor well and water supply well at the mine site prior to any collection of water

samples. These measurements will be made from a permanent reference point clearly marked on the surface casing. Measurements shall be made to the nearest 0.01 foot, and shall be reported as ground water elevation.

- b. Frequency: After completion of accelerated background monitoring as required in Part I.E.4(c)(4) below, routine ground water monitoring shall be done at upgradient wells semi-annually and at downgradient wells quarterly. Upgradient wells screened in the Moenkopi Formation (GW-2 and GW-4) shall be sampled annually.
- c. Sampling Procedures: Grab samples of ground water from all compliance monitoring wells shall be collected and analyzed in conformance to the Sampling Quality Assurance Plan (Part I.E.1) that has been approved by the Executive Secretary.
 - 1) Analysis of all ground water samples shall be performed by laboratories certified by the State Health Laboratory.
 - 2) Laboratory analytical methods used to analyze ground water samples must comply with the following:
 - i. Are methods cited in UAC R317-6-6.3, and
 - ii. Have detection limits which are less than or equal to those of the currently accepted analytical techniques for drinking water as determined by the U.S. Environmental Protection Agency.
 - 3) Analytical Parameters: The following analysis shall be conducted on all ground water samples collected.
 - i. Field Parameters: pH, temperature and specific conductance
 - ii. Lab Parameters: Total Dissolved Solids, sodium, calcium, potassium, magnesium, chloride, sulfate, bicarbonate, carbonate, dissolved phosphorus, uranium, gross alpha and gross beta
 - 4) Accelerated Background Monitoring: The permittee shall collect at least eight independent samples over a one-year period at all downgradient monitor wells and analyze them for the parameters listed above. This requirement shall apply to wells WW-E, CO-2, CO-4, GE-6, CO-6, GE-2, GE-3, GE-4, GE-5, and the future Gartra Grit monitor well.

5. Surface Water Monitoring

a. Routine Monitoring

Grab samples of water from Big Brush Creek shall be collected quarterly at the north sample point BCF (between the gorge and

mine road crossing) and downstream sample point BC191 (Highway 191 crossing), as identified in SF Phosphates' March 19, 1999 hydrogeology report. The stream flow rate shall also be determined at these points at the time of sampling. Samples shall be analyzed for total dissolved solids, gross alpha, combined Ra-226 and Ra-228, iron, total phosphorus and gross beta.

b. Background Monitoring

Before the water elevation in the tailings impoundment is raised above currently-permitted levels, the permittee must collect surface water samples during base flow (late summer or early autumn) according to the procedures in (a) above.

F. REPORTING REQUIREMENTS

1. Routine Reporting

The permittee shall furnish the Executive Secretary quarterly reports of compliance monitoring. Reports shall include the following information:

- a. Field data sheets, or copies thereof, including the field parameters required in Part I.E.(4), above, and other pertinent field data, such as well name, date and time, names of sampling crew, depth to ground water, type of sampling pump or bailer, calculated casing volume and volume of water purged before sampling.
- b. Results of analyses of surface and ground water samples required in Part I. E.(4), including date sampled, date received and results of analysis for each parameter, including: value or concentration, units of measurement, method detection limit for the examination, analytical method and date of analysis. The analytical methods and method detection limits for every parameter must conform to those in the approved Sampling Quality Assurance Plan to be developed according to the provisions of Part I.E.1, above.
- c. Reports of ground water elevations measured at monitor wells and water supply wells at the mine site, and an evaluation of:
 - i. Whether the data indicates that a downward hydraulic gradient exists between the Weber Aquifer and shallow aquifers in the vicinity of the wells where ground water elevations have been measured, and
 - ii. Whether the ground water elevation data and/or ground water chemistry data indicates significant ground water flow bypassing the cutoff slurry walls.
- d. The quantity of dissolved solids passing both Big Brush Creek sampling sites in 24 hours, as derived from the estimated flow rates and the TDS analyses at each site.

- e. Routine quarterly monitoring shall be reported according to the schedule below, unless modified by the Executive Secretary:

Monitoring Periods

Jan., Feb., March

Apr., May, June

July, Aug., Sept.

Oct., Nov., Dec.

Report Due Dates

May 1

August 1

November 1

February 1

2. Noncompliance or Probable Noncompliance

Reporting requirements for noncompliance or probable noncompliance status shall be according to the provisions of Part I.G.

3. Electronic Filing Requirements

In addition to submittal of the hard copy data as required above, the permittee will electronically submit ground water monitoring data in the electronic format specified by the Executive Secretary. The data may be sent by e-mail, floppy disk, modem or other approved transmittal mechanism.

G. NONCOMPLIANCE STATUS

1. Probable Noncompliance Based on Exceedance of Ground Water Protection Limits

Ground water protection levels and compliance limits shall be determined following the accelerated background monitoring required in Part I.E.4(c)(4) above. After the one-year background monitoring period, the permit shall be reopened and incorporate these standards, based on the background data and UAC R317-6-3, for total dissolved solids, dissolved phosphorus, uranium, gross alpha and gross beta.

Probable noncompliance exists if the results of quarterly ground water monitoring indicate that the protection levels are exceeded for any parameter in any downgradient compliance monitoring well. In this case the permittee shall notify the Executive Secretary of the probable noncompliance within 5 days of its detection, resample the monitor well where the probable noncompliance has occurred and submit the analytical results thereof within 30 days of the original detection.

2. Noncompliance Status Due to Exceedance of Ground Water Protection Levels

The permittee shall be in noncompliance when the value for any one ground water pollutant exceeds both the protection level and the background mean concentration plus two standard deviations in two consecutive sample events from a ground water compliance monitoring point, which are required under the terms of this permit, in accordance with UAC R317-6-6.17.

a. Notification and Accelerated Monitoring

Upon determination by the permittee, in accordance with UAC R317-6-6.17 that noncompliance exists, the permittee shall:

- i. Verbally notify the Executive Secretary of the noncompliance within 24 hours, and provide written notice within 5 days of the detection, and
- ii. Immediately implement an accelerated schedule of monthly ground water monitoring for all wells that are both adjacent to and completed in the same geologic formation as the monitoring point well where the exceedance occurred, which shall continue for two months or as required by the Executive Secretary.

b. Source and Contamination Assessment Study Plan

Within 30 days of the verbal notice to the Executive Secretary, the permittee shall submit an assessment study plan and compliance schedule, as applicable, for:

- i. Assessment of the source or cause of the contamination, and determination of steps necessary to correct the source, if the contamination is caused by facilities or activities for which the permittee is responsible.
- ii. Assessment of the extent of the ground water contamination and any potential dispersion.
- iii. Evaluation of potential remedial actions to restore and maintain ground water quality, and ensure that the ground water standards will not be exceeded at the downgradient monitoring wells.

3. Noncompliance Due to Failure of Discharge Minimization Technology

The facility will be determined to be in noncompliance status if the tailings dam, slurry walls, or other features required for discharge minimization technology have failed or cannot be maintained according to the provisions required by this permit, unless:

- a. The permittee has notified the Executive Secretary of the potential noncompliance situation verbally within 24 hours and in writing within 5 days of becoming aware of it, and
- b. The failure was not intentional or was not caused by the permittee's negligence, either in action or failure to act, and
- c. The permittee has taken adequate remedial measures in a timely manner or has developed an approvable remedial action plan and implementation schedule for restoration of discharge minimization technology, an equivalent technology or closure of the facility (implementation of an equivalent technology will require permit modification and reissuance), and

- d. The permittee has demonstrated that any discharge of a pollutant from the facility is not in violation of the provisions of UCA 19-5-107.

H. COMPLIANCE SCHEDULE

1. Sample Quality Assurance Plan

The Sample Quality Assurance Plan required in Part I.E.1 shall be submitted for review within 30 days of the effective date of this permit.

2. Surface Water Background Monitoring Report

Surface water background monitoring as required in Part I.E.5(b) shall be done in August, September or October before dam expansion construction may begin. Results must be reported to the Executive within 60 days of the sampling.

3. Ground Water Accelerated Background Monitoring Report

Within one year and 90 days of permit issuance, the permittee shall submit a report containing all the results of accelerated background monitoring as required in Part I.E.4(c)(4).

4. Discharge Evaluation Report

Within one year of the effective date of this permit, the permittee shall submit a report to the Executive Secretary which evaluates the effect of seepage from the tailings dam on waters of the state. The report must estimate the quantity and chemical quality of water which is discharged to the subsurface beneath the tailings dam and the impoundment, whether there is any significant flow of seepage through the Moenkopi Shale, the effects of the seepage on the alluvial aquifer and other waters of the state, and whether it is necessary or feasible to upgrade the slurry cutoff walls to prevent pollution of waters of the state.

5. Monitor Well As-Built Report

Within 120 days of permit issuance the permittee shall install additional monitor wells as required in Part I.E.2, and submit a report on the well construction, including surveyed location, elevation of water level measuring point, well construction and screening details, and a log of geologic materials encountered during drilling.

6. Conceptual Contingency Plan

Within six months of the effective date of this permit, the permittee shall submit a Conceptual Contingency Plan for review by the Executive Secretary. The plan must list actions that may be taken to reduce the ground water discharge in case ground water protection levels or surface water standards in Big Brush Creek are exceeded.

II. REPORTING REQUIREMENTS

- A. REPRESENTATIVE SAMPLING. Samples taken in compliance with the monitoring requirements established under Part II shall be representative of the monitored activity.
- B. ANALYTICAL PROCEDURES. Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.3L, unless other test procedures have been specified in this permit.
- C. PENALTIES FOR TAMPERING. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- D. REPORTING OF MONITORING RESULTS. Monitoring results obtained during each quarterly reporting period specified in the permit, shall be submitted to the Executive Secretary, Utah Division of Water Quality at the following address according to the schedule in Part I.F.1(e):

Attention: Ground Water Protection Program
State of Utah
Division of Water Quality
288 North 1460 West
Salt Lake City, Utah 84114-4870

The due dates for reporting are defined in Part II G of this permit.

- E. COMPLIANCE SCHEDULES. Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.
- F. ADDITIONAL MONITORING BY THE PERMITTEE. If the permittee monitors any pollutant at a compliance monitoring point more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.
- G. RECORDS CONTENTS.
 - 1. Records of monitoring information shall include:
 - a) The date, exact place, and time of sampling or measurements;
 - b) The individual(s) who performed the sampling or measurements;
 - c) The date(s) and time(s) analyses were performed;
 - d) The name of the certified laboratory which performed the analyses;
 - e) The analytical techniques or methods used; and,

- f) The results of such analyses.
- H. RETENTION OF RECORDS. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time.
- I. NOTICE OF NONCOMPLIANCE REPORTING.
1. The permittee shall verbally report any noncompliance which may endanger public health or the environment as soon as possible, but no later than 24 hours from the time the permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24 hour number, (801) 538-6333, or to the Division of Water Quality, Ground Water Protection Section at (801) 538-6146, during normal business hours (8:00 am - 5:00 pm Mountain Time).
 2. A written submission shall also be provided to the Executive Secretary within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
 - a) A description of the noncompliance and its cause;
 - b) The period of noncompliance, including exact dates and times;
 - c) The estimated time noncompliance is expected to continue if it has not been corrected; and,
 - d) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 3. Reports shall be submitted to the addresses in Part II D, Reporting of Monitoring Results.
- J. OTHER NONCOMPLIANCE REPORTING. Instances of noncompliance not required to be reported within 5 days, shall be reported at the time that monitoring reports for Part II D are submitted.
- K. INSPECTION AND ENTRY. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under

this permit; and,

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

- A. DUTY TO COMPLY. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of the Water Quality Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- B. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS. The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding \$50,000 per day. Nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.
- C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- D. DUTY TO MITIGATE. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- E. PROPER OPERATION AND MAINTENANCE. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

IV. GENERAL REQUIREMENTS

- A. PLANNED CHANGES. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility which could significantly change the nature of the facility or increase the quantity of pollutants discharged.
- B. ANTICIPATED NONCOMPLIANCE. The permittee shall give advance notice of any planned changes in the permitted facility or activity which is anticipated may result in noncompliance with permit requirements.

- C. **PERMIT ACTIONS.** This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- D. **DUTY TO REAPPLY.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application should be submitted at least 180 days before the expiration date of this permit.
- E. **DUTY TO PROVIDE INFORMATION.** The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.
- F. **OTHER INFORMATION.** When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.
- G. **SIGNATORY REQUIREMENTS.** All applications, reports or information submitted to the Executive Secretary shall be signed and certified.
1. All permit applications shall be signed as follows:
 - a) For a corporation: by a responsible corporate officer;
 - b) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
 2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a) The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,
 - b) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
 3. **Changes to Authorization.** If an authorization under Part IV.G.2. is no

longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV.G.2. must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- H. PENALTIES FOR FALSIFICATION OF REPORTS. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- I. AVAILABILITY OF REPORTS. Except for data determined to be confidential by the permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Executive Secretary. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.
- J. PROPERTY RIGHTS. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
- K. SEVERABILITY. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- L. TRANSFERS. This permit may be automatically transferred to a new permittee if:
 1. The current permittee notifies the Executive Secretary at least 30 days in advance of the proposed transfer date;
 2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,
 3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue

the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

- M. STATE LAWS. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-117 of the Act.
- N. REOPENER PROVISIONS. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:
 - 1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The permittee may apply for a variance under the conditions outlined in R317-6.4(D)
 - 2. Changes have been determined in background ground water quality.

F:\WQ\PERMITS\MNOVAK\WPS\FPHCOMM.PER.wpd

FILE COPY

Permit No. UGW470001

STATEMENT OF BASIS

MTN
QA

S.F. PHOSPHATES LIMITED COMPANY TAILINGS STORAGE FACILITY

I. Description of Facility

S.F. Phosphates Limited Company operates a surface mine and concentrator facility for processing ore used in the production of phosphate fertilizer, located approximately 10 miles north of Vernal, Utah. This is an existing facility which has been in production, under three previous owners, since 1958. Phosphate ore is ground into a slurry near the mine site and pumped through a pipeline to the concentrator. The slurry is ground further at the concentrator in closed circuit with hydrocyclone classifiers. Coarse materials from the classifiers are processed in flotation cells to remove the phosphate mineral grains, which are pumped in a slurry pipeline to Rock Springs, Wyoming. Clay fines from the classifiers and barren mineral grains from the flotation cells are pumped to the Tailings Storage Facility. Clarified water from the tailings impoundment is reclaimed for re-use in the grinding mill by a barge-mounted pump. The tailings impoundment is unlined.

The tailings storage facility has been expanded twice since its first use in 1961. First one then two tailings ponds were impounded in ephemeral drainages behind dams of mine waste rock. In 1986 both of the earlier tailings dams were covered by an earthfill dam constructed of Moenkopi Formation borrow material from within the impoundment area. The final crest elevation of this dam will be 5970 feet when completed in 2000. The dam is 5600 feet in length and the impoundment has an area of 326 acres. Seepage from the dam is collected by drains and pumped back into the tailings impoundment. Fine clay-sized tailings are discharged in the northeast area of the impoundment, coarser tailings are deposited along the upstream face of the dam.

To create a greater capacity for tailings disposal, S.F. Phosphates proposes to raise the existing dam, first with one raise of 15 feet to bring it to the planned 5970 feet elevation, followed by 6 additional raises of 15 feet each. This would result in a final elevation of 6060 feet after about 44 years of operation.

Water contained in the tailings slurry has total dissolved solids (TDS) content of about 2000 mg/l, and elevated levels of gross alpha, uranium, manganese, chromium and thallium.

II. Description of Hydrogeology

The mine and tailings storage facility are located on the south flank of the Uinta Arch. Sedimentary rocks of Pennsylvanian to Triassic age in the vicinity dip 8 to 10 degrees southward. The mine's water supply wells tap an aquifer contained in the Pennsylvanian Morgan Formation and Weber Quartzite which underlie the site. This aquifer is recharged where the formations are exposed at a higher elevation north of the minesite, and it is under artesian pressure in the mine's water supply wells. The basal mudstone member of the overlying Permian Park City Formation probably acts as a confining layer for this aquifer. Phosphate ore is mined from the Park City Formation. The Triassic Moenkopi Formation overlies the Park City south of the mine, and is exposed at the surface in the vicinity of the tailings storage facility. The Moenkopi consists of siltstone, fine-grained sandstone, and gypsum, and is generally a barrier to ground water flow. The aquifer in the Morgan and Weber is protected from contamination at the tailings facility site by the confining beds in the Park City and Moenkopi and by its artesian pressure. The southernmost edge of the tailings impoundment comes onto contact with an escarpment formed by the Gartra Grit Member of the Triassic Chinle Formation, a medium to coarse grained sandstone, which overlies the Moenkopi. Approximately 1500 to 2000 feet east of the tailings dam is Big Brush Creek. A narrow band of alluvium is present adjacent to the creek, which contains a shallow unconfined alluvial aquifer. This aquifer discharges to the stream.

Ground water in the Moenkopi Shale underlying the impoundment most likely exists in localized, unconnected zones of saturation. Ground water quality in the Moenkopi is poor, with TDS content ranging from 4000 to 6000 mg/l.

The alluvial aquifer near the base of the tailings dam has apparently been affected by seepage from the tailings impoundment. Monitor wells completed in this aquifer show elevated levels of TDS, gross alpha and uranium.

While ground water in the Moenkopi is of poorer quality than the tailings water, the higher hydraulic head caused by the dam could cause increased ground water flow through the Moenkopi, which would result in increased dissolution of gypsum and flow into higher-quality aquifers. If any pollutants from the tailings water or the Moenkopi are discharged to the alluvial aquifer, they may eventually discharge into Big Brush Creek.

III. Basis for Permit Issuance

SF Phosphates does not propose to line the tailings impoundment. While water associated with the tailings is of generally better quality than ground water in the underlying Moenkopi Shale, the impoundment may affect waters of the state by increased subsurface flow through the Moenkopi and discharge into better-quality ground and surface water. SF Phosphates will be required to monitor ground and surface water which may be impacted by the tailings impoundment, and develop a conceptual contingency plan for stopping any excessive discharge of contaminants if revealed by monitoring.

IV. Basis for Specific Permit Conditions

a. Ground Water Monitoring

Because of the hydrogeologic conditions at the site and previous releases to ground water, a comparison of ground water quality upgradient and downgradient of the site could not evaluate possible impacts on waters of the state. Ground water monitoring shall focus mainly on the alluvial aquifer at the base of the tailings dam, which would be the first ground water to be affected by discharges from the impoundment. Because this is an existing facility and the alluvial aquifer has already been affected by seepage from the dam, its original background water quality cannot be known. As a permit condition, SF Phosphates shall determine existing background water quality at five existing wells in the alluvial aquifer. No further deterioration in water quality beyond protection levels derived from this background data will be permitted.

In addition, SF Phosphates shall monitor ground water to evaluate the facility's effects on ground water quality in the Weber aquifer, the Moenkopi Formation, and the Gartra Grit Member, and also determine a point where ground water quality in the alluvial aquifer unaffected by dam seepage may be evaluated. Water quality in the tailings seepage reclaim pond shall also be monitored.

b. Surface Water Monitoring

To demonstrate the effectiveness of the tailings water containment, the facility must not cause surface water standards for TDS, gross alpha and beta, radium, iron and phosphorus to be exceeded in Big Brush Creek. Discharge of salts must also be kept to a minimum according to the provisions of the Colorado River Basin Salinity Forum. Because discharge from the alluvial aquifer into the stream is diffuse and not a point source, SF Phosphates shall monitor water quality upstream and downstream from the tailings dam. During this permit term, data from this monitoring will be used primarily to determine baseline conditions before significant expansion of the tailings facility. It is possible that some of the degradation in water quality at this site is natural, from stream water coming in contact with the Moenkopi Shale, or that surface water standards may be exceeded due to contaminant sources upstream of the tailings facility. In the event that monitoring reveals changes from the baseline conditions, natural and/or upstream sources of contamination will be evaluated by SF Phosphates and DWQ. These potential sources of contamination will be taken into account by DWQ before assessing compliance with surface water standards or the Colorado River Basin Salinity Forum.

c. Discharge Minimization Technology

The tailings dam was constructed over three alluvium-filled drainages incised into the Moenkopi Shale. In an effort to contain seepage through the alluvium, cutoff slurry walls were installed in these drainages by SF Phosphates' predecessor at the site, Chevron Resources Co. Seepage which collects behind the slurry walls is eventually returned to the tailings pond. Investigations by SF Phosphates indicate that the middle slurry wall allows some seepage to bypass the walls and

presumably affect the alluvial aquifer adjacent to Big Brush Creek. As a permit condition, SF Phosphates shall evaluate seepage through the alluvium, cutoff slurry walls and Moenkopi Shale underneath the tailings dam, and whether any additional control structures are necessary and feasible to protect ground and surface water quality downgradient of the dam.

d. Conceptual Contingency Plan

As a permit condition, SF Phosphates must develop a conceptual contingency plan to be followed in case ground water protection levels or surface water standards in Big Brush Creek are exceeded. The plan shall list actions that the company will take, as appropriate, in case water quality standards are exceeded.